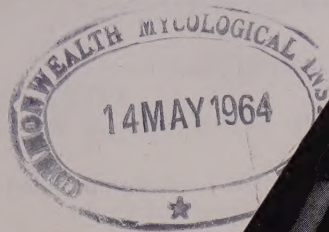


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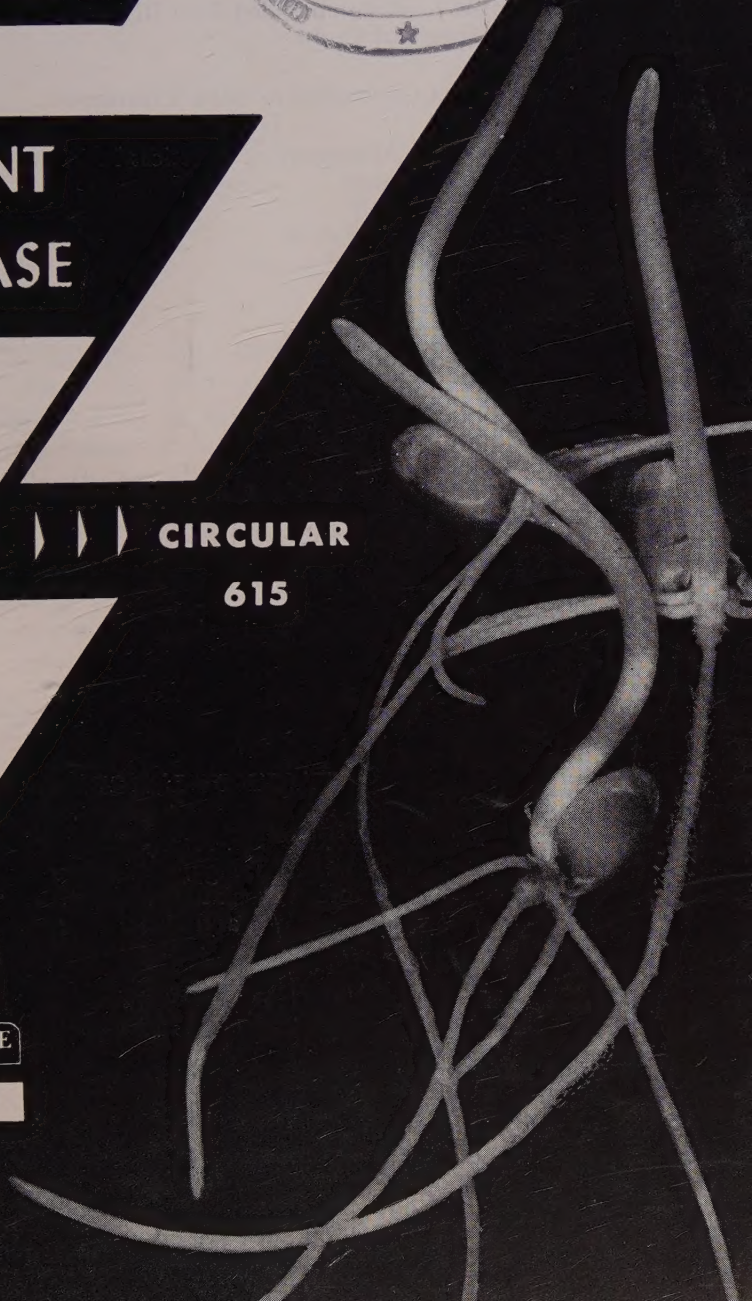
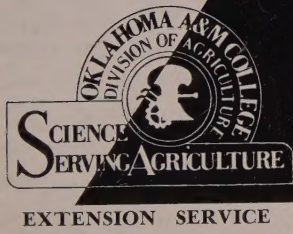
Seed Treatment

for

PLANT
DISEASE



Control >>> CIRCULAR
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SEED TREATMENT

for

PLANT DISEASE CONTROL

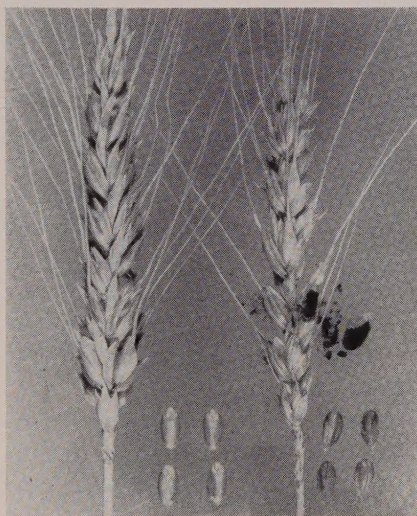
By
Wesley Chaffin
Extension Agronomist

In the United States, the average annual loss from plant disease is estimated to be about 3 billion dollars. Oklahoma agriculture takes its full share of this tremendous loss.

When crops are planted, both the seed and the young seedlings may be attacked by disease organisms which live on the seed and in the soil. These harmful bacteria and fungi cause rotted seed and injured seedlings before or soon after emergence. This results in thin stands and retarded plant growth. Some diseases, such as angular leaf spot of cotton and bunt, or stinking smut, of wheat, persist through the seedling stage and may cause serious damage to the crop in later growth.

Much of the loss from seedling diseases can be prevented by proper treatment of seed before plant-

ing. Chemically treated seed generally produces more even stands of healthier, stronger plants than



Bunt or stinking smut of wheat. Left: healthy head and kernels; right: infested head with smut balls instead of grain. This disease can be controlled by seed treatment.



Loose smut of wheat. Left: healthy head; right: heads destroyed by smut. Loose smut cannot be controlled by seed treatment. Instead, new, clean seed should be used.

untreated seed. This is one of the cheapest and surest ways to obtain better stands, increase yields and improve the crop quality. When full, even stands are obtained, the weed control problems become less difficult, particularly in small grains and other drill planted crops. Seed treatment is most useful in seasons when adverse weather conditions occur at planting time.

Seed treatment is recommended especially for cotton, corn, sorghums, small grains, peanuts, and castor beans.

Methods of Treatment

The methods of seed treatment in general use are known as the dust method, the slurry method, and a third one using water soluble materials.

Most seed treatment chemicals come in dust form and can be applied by the dust method. The dust and seed are placed in a treat-er or tight container and thoroughly mixed until all the seeds are covered with a film of dust.

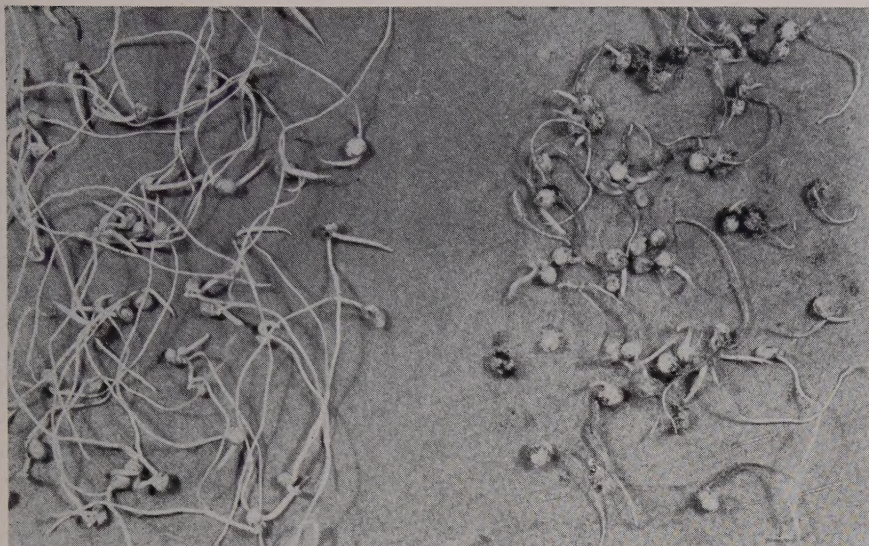
The dusts are poisonous if inhaled and some of them may cause skin irritation. Consequently, when the dust method is used, masks and

gloves should be worn by the operators.

The slurry method of treatment was designed primarily to eliminate the disagreeable features of dust. This method is preferred when



Black point, a disease of wheat. The six kernels on the right are infested. If germination is low, new, clean seed should be planted.



Chemical treatment of sorghum speeds germination and produces healthy, vigorous seedlings. The seedlings on the left were treated. Those on the right were not. Note the slow growth and moldy condition of the untreated seedlings.

equipment is available. Most seed treatment chemicals are available in forms specially adapted for use in the slurry treater. Adhesives which cause more of the chemical to stick to the seed have been added in some instances. The chemical is mixed with a very small amount of water and applied at a rate which will barely moisten the

seed.

Specially designed machines are needed to treat seed by the slurry method. Others are designed for treating seed with chemicals which are available in water soluble, or liquid form. When seed is treated by either of these methods, manufacturer's directions should be closely followed.

Treating Machines

There are several types of machines on the market for treating seed. Some are designed for application of dust only, some for both the dust and the slurry method and some for using the chemicals which are available in water soluble form. The machines vary in size and capacity. Farmers who want to treat their own seed usually find the smaller machines more practical. The larger machines are

designed for commercial seed treating plants. Portable cleaners and treaters are available in some sections of the state.

For treating very small quantities of seed, a homemade treater may be used.*

*Plans for home-made seed treaters are available by writing to the Extension Service, Oklahoma A&M College, Stillwater, Oklahoma.

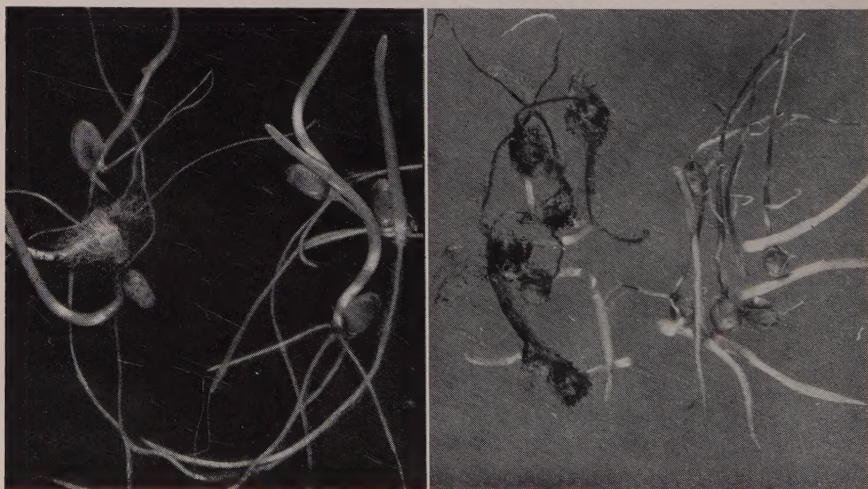


Upper left: This shows the effect of seed treatment on cotton. The strong, vigorous seedlings on the left were produced from treated seed. Note the slow germination and moldy conditions of the untreated seed (right).

Upper right: Stem rust of wheat. This picture shows the stem (center) and the leaves of a wheat plant grown from untreated seed.

Lower left: This picture shows the effect of seed treatment on wheat. The left seed was not treated. Note the moldy condition of the seedlings. The seed on the right was treated. These seedlings are healthy and vigorous.

Lower right: Sorghum seedlings. The seed on the right was treated. Note the healthy, vigorous seedlings from the treated seed (left).



Treating Legume Seeds

Chemical treatment of legume seeds, particularly sweet clover, alfalfa, vetch, and the pasture clovers, is not generally recommended because of the harmful effects of the chemical on inocula-

tion and formation of root nodules. When seed is to be both chemically treated and inoculated, it is important that the chemical treatment be applied first. The seed should then be inoculated just before it is planted.

Caution

Seed treatment chemicals are poisonous and treated seed should not be fed to livestock or used as human food.

It is also unlawful to sell treated seed for use as livestock feed or for human consumption.

What to Use

The recommended seed disinfectants for each crop, together with the amounts to use and the diseases which are controlled by seed treatment are shown in the table on pages 8, 9 and 10.



Seed treatment made the difference between these two rows of cotton. These rows were part of the seed treatment tests at the Oklahoma Cotton Research Station at Chickasha in 1953.

TABLE I.—Recommended Seed Disinfectants for Specified Crops
(See "Caution", page 7)

<i>Materials</i>	<i>Amounts to Use as Dust Treatment¹</i>	<i>Diseases Controlled or Reduced</i>
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W H E A T

Ceresan M	1/2 oz. per bu.	Covered or Stinking
Panagen	3/4 oz. per bu. ²	Smut, Seedling
Agrox	1/2 oz. per bu.	Blight, Seed decay.
Mema ²		

Note: Chemical treatment of seed does not control loose smut of wheat.

O A T S

Ceresan M	1/2 oz. per bu.	Smuts (loose and covered), Seedling
Agrox	1/2 oz. per bu.	Blights, Victoria
Agrano		Blight in early stages.
Mema ²		

B A R L E Y

Ceresan M	1/2 oz. per bu.	Covered Smut,
Panagen ²	3/4 oz. per bu.	Barley Stripe,
Mema ²		Seedling Blight

Note: Chemical treatment of the seed does not control true loose smut of barley.

S O R G H U M S

Arasan	2 oz. per bu.	Seedling Blight,
Mema ²	Kernel Smut,	Seed decay.

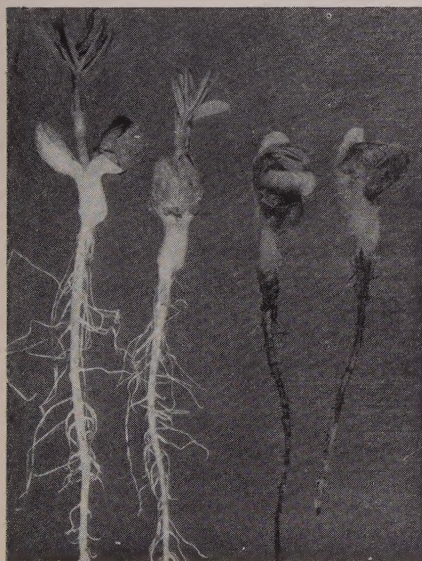
C O R N

Field and Sweet

Arasan	3/4 oz. per bu.	Seedling Blight,
Semesan Jr.	1 1/2 oz. per bu.	Seed decay.

TABLE I.—Con't.

<i>Materials</i>	<i>Amounts to Use as Dust Treatment¹</i>	<i>Diseases Controlled or Reduced</i>
PEANUTS		
Arasan	2 oz. per 100 lbs.	Seedling Blight,
Spargon	3 oz. per 100 lbs.	Damping off,
Dow 9-B	3 oz. per 100 lbs.	Seed decay.
Thiram 50	2 oz. per 100 lbs.	
Phygon	3 oz. per 100 lbs.	
SOYBEANS		
Arasan	2 oz. per bu.	Seedling Blight,
Spargon	2 oz. per bu.	Damping off,
Thiram 50	2 oz. per bu.	Seed decay.
CASTOR BEANS		
Arasan	2 oz. per bu.	Seedling Blight,
Thiram 50	2 oz. per bu.	Damping off, Seed decay.
FLAX		
Ceresan M	1 ½ oz. per bu.	Pasmo Disease,
Panagen	1 ½ oz. per bu. ²	Seed decay.
Mema ²		Seedling Blights.



The peanut seedlings on the left were produced from treated seed. Those on the right sprouted from untreated seed.

<i>Materials</i>	<i>Amounts to Use as Dust Treatment¹</i>	<i>Diseases Controlled or Reduced</i>
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COTTON

Fuzzy or Gin-Run Seed

Ceresan M	4 ½ oz. per 100 lbs.	Seedling Diseases,
Dow 9-B	4 ½ oz. per 100 lbs.	Damping off,
Mema ²		
Panagen	4 ½ oz. per 100 lbs.	Angular Leaf Spot,
Agrox	4 ½ oz. per 100 lbs.	Boll Rot.

Reginned Seed

Ceresan M	3 oz. per 100 lbs.	
Dow 9-B	3 oz. per 100 lbs.	
Mema ²		(Same as above)
Panagen	3 oz. per 100 lbs.	
Agrox	4 oz. per 100 lbs.	

Acid Delinted

Arasan	4 oz. per 100 lbs.	
Spergon	4 oz. per 100 lbs.	
Thiram 50	4 oz. per 100 lbs.	
Dow 9-B	3 oz. per 100 lbs.	
Ceresan M	3 oz. per 100 lbs.	
Mema ²		(Same as above)
Captan	3 oz. per 100 lbs.	
Ortho Seed	3 oz. per 100 lbs.	
Guard		

Diseases Not Controlled by Seed Treatment

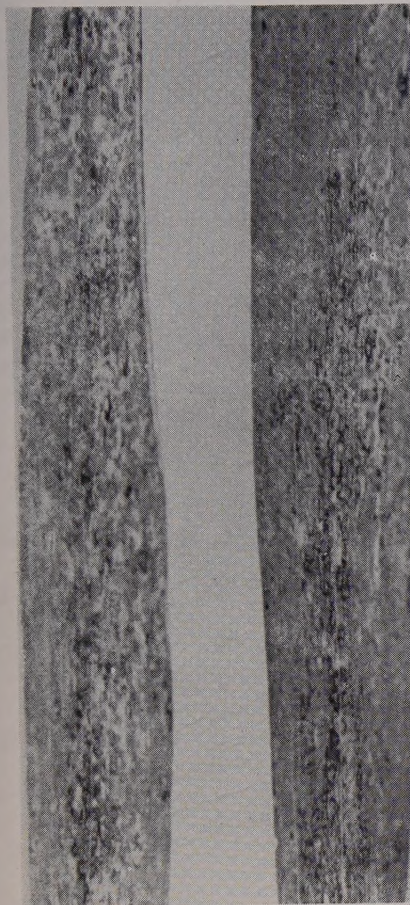
Many of the common plant diseases cannot be effectively controlled by seed treatment. Some crop varieties are partially or completely resistant to certain diseases. A regular system of crop rotation is

an excellent means of reducing losses from some plant diseases.

Suggestions concerning certain plant diseases which are not controlled by seed treatment are given in the table on page 12.

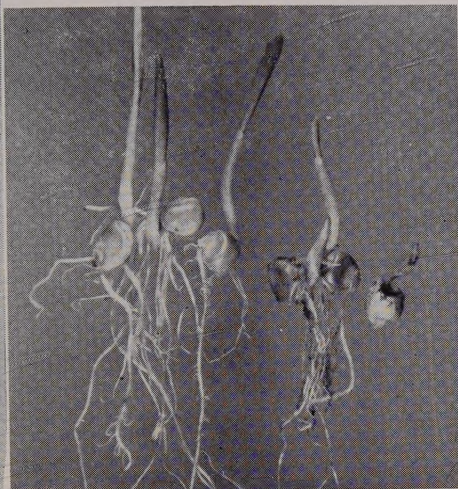
¹ Amounts given in the table are those generally used when the chemicals are applied in dust form. Rates of application are different with the slurry treatment. Regardless of the method used, directions given by the manufacturer should be followed in all cases.

² Panagen and Mema are in liquid form and are applied with equipment specially designed for that purpose. Use rates of application recommended by the manufacturer.



Left: Leaf rust is the most destructive disease of wheat in Oklahoma. It cannot be controlled by seed treatment. Some of the recommended varieties have considerable resistance to this disease.

Below: Seed treatment of corn gives quicker germination and stronger, healthier seedlings. The seedlings on the left came from treated seed; on the right, from untreated.



Bottom of page: Seed treatment protects corn against seedling blight and seed decay. The seedlings on the left were treated those on the right were not.

TABLE II.—Management Practices in Plant Disease Control

WHEAT

<i>Disease</i>	<i>Control Measures</i>
Loose Smut	Obtain new, disease-free seed.
Root rot and	Certified or registered seed
Crown rot	is best.
Soil Borne	Rotate with a legume.
Mosaic	Use resistant varieties.

ALL SMALL GRAINS

Leaf and Stem	Use resistant varieties when
Rusts	possible.

COTTON

Cotton Root rot	Rotate cotton with a legume, such as annual sweet clover or vetch.
Cotton Wilt (Fusarium)	Use a high potash fertilizer for cotton on soils where wilt is a problem.

SORGHUMS

Charcoal Rot	Crop rotation—Good cul- tural practices.
Milo Disease	Resistant varieties are available and these should be used.

PEANUTS

Southern Blight	No effective means of control. Rotate peanuts with other crops.
Leaf Spot	See Okla. Ext. Cir. 410, "Peanuts".